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ABSTRACT

This report investigated the determinants of college students' overall evaluations of their academic programs (major field of study). The manner in which students weight the various domains of satisfaction and dissatisfaction in determining their level of overall program satisfaction was examined. The gender differences and field differences in assessing these domains were also investigated. Multivariate analyses were conducted on the responses of 758 graduating sniors in regard to specific and overall academic satisfaction as indicated on specific items of Rudolf Moos' College Experiences Questionnaire. Results of the study indicated that, generally, stimulating course-work and good teaching were more important than opportunities for faculty-student interaction or perceived faculty knowledgeability. However, there were significant field and gender differences. These findings led researchers to the conclusion that the processes of satisfaction formation are not uniform across such groupings. (DWH)

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DETERMINANTS OF COLLEGE STUDENTS' OVERALL EVALUATIONS OF THEIR ACADEMIC PROGRAMS*

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Paper for presentation at the Annual Meeting of the American Educational Research Association, April 1985.

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Determinants of College Students' Overall
Evaluations of Their Academic Programs

ABSTRACT

This research explored the determinants of college seniors' overall evaluations of their academic programs (i.e., their major departments). The research was conducted with a sample of 758 students at two universities. The results suggest that, in general, stimulating coursework and good teaching were somewhat more important than opportunities for faculty/student interaction or perceived faculty knowledgability. There were significant field and gender differences, however. For example, faculty availability and course stimulation were more critical among women than men, and faculty knowledgability was particularly significant in scientific fields. Theoretical and applied implications are discussed.

Determinants of College Students' Overall Evaluations of their Academic Programs

The objective of the research reported here was to investigate the determinants of college students' overall evaluations of their academic programs (i.e., their major departments). Since student satisfaction may be significant both for program evaluation and theories of educational achievement, it is important that it be well understood. Of particular importance is the possibility that different student groups may weight the various components of department performance differently in arriving at their overall judgments. These issues set the agenda for the present research.

Theoretical Perspective

Growing accountability pressures in higher education have focused unprecedented attention on the performance of academic programs (Keller, 1983). As a result, a wide variety of program performance indicators have been developed over the past fifteen years. Among the most prominent have been indicators of student academic gains, departmental cost-effectiveness, and faculty research productivity. Nevertheless, the "softer", presumably less measurable aspects of performance, such as overall student satisfaction, have only recently begun to receive serious analytic attention (see Korstain, 1977). The impetus to do so has come from at least three directions.

First, increased attention to students' evaluations of their courses has led some investigators to wonder how those evaluations might relate to students' overall attitudes towards their academic contexts. For example, Neumann and

Neumann (1981), in the tradition of Burack (1975), argue strongly that student satisfaction at the departmental or college level may be of far greater relevance for academic decision making than satisfaction at the level of a course or individual faculty member. The Neumanns suggest that departmental satisfaction, in particular, compared to course/faculty satisfaction, may better reflect attitudes toward the college, may more powerfully influence attrition, course selection, and post-graduation behaviors, and may reflect critical information regarding the attractivenees of the college to outsiders. As such, they argue, administrators should seek more information on student evaluations at the department level.

Second, leading organizational scholars have begun to pay increasing attention to the interpretations people place on their immediate contexts. In the prescriptive literature, popular works by Peters and Waterman (1982) and Deal and Kennedy (1982) have signaled a rebirth of the cultural, phenomenological, and affective orientations in management thinking. That rebirth has in many ways been rooted in the more basic organizational analyses of Weick (1979), Clark (1970), Pondy and Mitroff (1978), Keeley (1978), Kanter and Brinkerhoff (1981), and others. The trend has found its way into the higher education literature largely by way of the work of Kim Cameron and his colleagues at the National Center for Higher Education Management Systems (e.g., see Cameron, 1978, 1981). Cameron believes student and faculty satisfaction levels are important aspects of organizational effectiveness in colleges and universities.

Third, several innovative analyses have been conducted regarding the nature of the relationship between students' academic satisfaction and their academic performance. In a particularly sophisticated study in this genre, Bean and

Bradley (1984) found that satisfaction seems more a cause than an effect of academic performance. Clearly, such results strengthen the case for increased theoretical and administrative attention to determinants of academic satisfaction.

In light of these developments, analysts have begun to undertake more systematic explorations of the concept, measurement, causation, and significance of student academic satisfaction (see Morstain, 1977; Bare, 1980; Hermans, 1978; Stumpf, 1979). On some matters, this research has produced relative consensus. For example, researchers generally believe there are several significant, and somewhat distinct, domains of student academic satisfaction. Among these are faculty supportiveness and availability, faculty knowledgability, liveliness of teaching styles, and orderliness of course presentations (see especially Crawford and Bradshaw, 1968; Keaveny and McGann, 1978; Neumann and Neumann, 1981).

Yet the research has not as yet addressed in sufficient depth some fundamental questions. First, how do students weight the various domains of satisfaction and dissatisfaction (e.g., faculty availability, faculty teaching ability, etc.) in arriving at their levels of overall program satisfaction? The results relating to this issue are somewhat non-commensurable, yet seeking the optimal proportions of the "ingredients" for producing satisfaction, within given cost constraints, seems a particularly important issue for educational practice. Earlier research by Moos (1979), Walberg (1976) and others suggests that academic satisfaction in elementary and secondary school classrooms is more determined by social support levels than by levels of intellectual stimulation and challenge. Similarly, at the postsecondary level, Astin (1977) and Pascarella (1980) have suggested that faculty-student interaction and student

engagement in various academic activities may be central to their academic satisfaction. Transferring those findings to the postsecondary program level leads to the first hypothesis evaluated in the present research: student evaluations of their major departments will be more closely related to indicators of social support by faculty and other students than to indicators of intellectual stimulation and challenge in the department.

Second, are there gender differences in how students weight various specific domains in arriving at their overall satisfaction levels? Hints of raw gender differences in levels of satisfaction with college programs were found by Neumann and Neumann (1981) but not by Braskamp et al (1979). Evidence regarding gender differences in the weighting of various factors causing satisfaction is rare, however. In other words, while research has shown that gender may have effects on satisfaction levels, it has not addressed in much detail the processes that may lie behind such differences. Earlier research by the author (Hearn and Olzak, 1981) found women somewhat more attuned to faculty/student interactions and other aspects of classroom social climate than men in their satisfaction patterns. This result was in keeping with a variety of literature on gender differences in schooling effects (see especially McDill and Rigsby, 1973; Weidman, 1979; and Phelan, 1979). For that reason, a second hypothesis was investigated here: in their evaluations of their major departments, women will be more sensitive than men to levels of social support (from faculty and other students).

Third, are there field differences in how students weight various specific domains in arriving at their overall satisfaction levels? Hints of raw field differences in satisfaction levels were found by Gamson (1967), Bare (1980), and Neumann and Neumann (1981) but not by Braskamp et al. (1979). As with gender

differences, however, evidence of field differences in weighting of the various factors potentially prompting satisfaction is rare. In other words, the origins of such differences have been less studied. Nevertheless, some strong hints are found in the literature based in the well-known Biglan model (see Biglan, 1973; Smart and Elton, 1975; Neumann and Neumann, 1983). That literature suggests that faculty and students in "soft" areas, particularly those in the "pure" soft areas (psychology, philosophy, history, English, etc.), may be especially oriented to teaching. In keeping with that literature, a third hypothesis was examined: in their major department evaluations, students in the social sciences, arts,and humanities will rely more than others on levels of teaching quality (as opposed to more distal, research-oriented factors, such as perceived levels of faculty knowledgability or commitment to their fields).

Fourth, are there within-field gender differences in how students weight various specific domains in arriving at their overall satisfaction levels? While this topic has only rarely been investigated, it is directly relevant to issues of gender differences in enrollments in certain fields. For example, there has been concern within the engineering profession over the paucity of females choosing the field (see Durio and Kildow, 1980). In keeping with the second hypothesis above, the fourth hypothesis for the present study was as follows: women in scientific and technical fields, compared to men in those fields and students in other fields, will be especially attuned in their evaluations to the various aspects of social support, since their presence in those majors is more socially "daring" (as a violation of traditional sex-role norms), whereas gender differences will be weaker in less clearly sex-differentiated majors (e.g., the social sciences).

The hypotheses above are grounded in one central assumption: that better understanding of student satisfaction is fundamental to better understanding of educational process and quality. It seems reasonable to suggest that academic program satisfaction may be the most critical mediating variable between students' entering characteristics and departmental features, on the one hand, and students' persistence and attainment in their chosen fields, on the other. In addition to being grounded in that assumption, the last three of the hypotheses above are grounded in one central proposition: that there are indeed significant and consistent differences between sexes and among fields in the criteria for students' academic satisfaction.

Research Design

Methods: The study is based in multivariate analysis of college students' survey responses to specific and overall academic satisfaction items. Multiple regression techniques were used to assess the relationships between a global dependent variable indicator (overall satisfaction with major department experiences) and several more specific independent variable indicators. Six of the independent variable indicators were primary: these six tapped student satisfaction with particular aspects of major department experiences. The remaining five independent variable indicators, denoting student gender and major area, were employed in order to address the issue of whether or not the relationships between global satisfaction and specific aspects of satisfaction might be empirically different across selected groupings of students, i.e., whether or not the primary determinants of overall satisfaction might differ across the different groupings.[1]

This issue was addressed by following a series of steps outlined by Pedhazur (1982). Pedhazur suggests that regressions be run separately by group only when a significant interaction effect involving that grouping indicator is found in the regression for the entire sample.[2] Therefore, in the present analysis, regressions were run separately by gender, by field, and by gender within field only after that approach was suggested by appropriate tests of product interaction terms in the full-sample regression (i.e., only after one could defensibly reject the null hypothesis that there were no across-group differences in the ways students weigh various factors in arriving at their overall evaluation of their major department experiences). For rejecting the null hypothesis regarding such differences, Pedhazur suggests using a quite liberal significance level, even one as high as $p \leq .25$. Accordingly, the present analysis used a somewhat high level ($p \leq .15$).

An example may clarify the procedure. A regression was initially run using the six specific satisfaction indicators and four of the grouping characteristics indicators. These latter indicators denoted gender and three of the four major field groupings used for the study (these groupings are described in the variable indicators section below; one of the four major field indicators was not included in the regressions in order to provide a comparison group for the analysis). The regression results for this simple model provided the baseline against which potential group differences were to be judged. Indicators of such differences were constructed by multiplying grouping indicators by specific satisfaction indicators. For example, to assess whether there might be gender differences in the importance of faculty contact (as suggested by the second hypothesis above), the indicator for gender was first multiplied by the indicator for satisfaction with faculty availability to students outside of

classroom settings. The new interaction indicator thus produced was then added to the basic regression model initially tested. If the resulting gain in explained variance (R^2) was significant at the $p \leq .15$ level, then a significant gender difference was inferred. Accordingly, the sample was divided by gender and regressions run separately for males and females.

Sample: The sample was drawn from the graduating seniors at two universities, one a large, public university in a small rural community and the other a smaller, church-affiliated university in a busy urban area. The sampled students responded to a questionnaire developed by Rudolf Moos and his colleagues (see Moos, 1979). The College Experiences Questionnaire [CEQ] was administered in the Spring of 1973 in all freshmen living units and was completed by the majority of the freshman class at the two institutions. The College Experience Questionnaire: 1976 Update [CEQ:76] was mailed in the Spring of 1976 to those seniors who had completed the CEQ as freshmen. The sample persistence rate over the three years was over 70 percent, and over 85 percent of those persisters returned a completed questionnaire, making the final sample of 758 students reasonably representative.

Included in the present study were students who had usable data for the relevant variables and whose major departments were in a subject area classifiable into four field categories: 1) the "hard" sciences and engineering, 2) the social sciences, 3) business-related areas, such as business administration, and 4) the arts and humanities.[3] Although students were reporting on their own majors, the study was not oriented to major area differences so much as generalized field differences, so the numbers in the various specific majors within the broad field categories were not critical to

the analysis. The sample was approximately evenly divided between the sexes (380 males, 378 females). A total of 360 students were in scientific and engineering majors, whereas 196 were in the social sciences, 92 were in the business-related majors, and 110 were in the arts and humanities.

Indicators: Students were asked to evaluate their major departments along a four-point scale where "very dissatisfied" equals one and "very satisfied" equals four. The dependent variable indicator simply asked students for their "overall evaluation." The specific elements of satisfaction addressed (i.e., the primary independent variable indicators for the study) are "professors' knowledge of their field," "professors' teaching ability," "availability of professors to students outside of class," "challenge and stimulation of course offerings," "professors' commitment to their field," and "opportunities for interaction with other students majoring in the field."

These satisfaction indicators were the primary independent analysis, but it was necessary to use also several dichotomous grouping indicators. These indicators (for gender and for field) were constructed using "effect coding". In other words, 1's and -1's were used for the gender indicator, whereas 1's and -1's were used in conjunction with 0's for the comparison group in the field indicator. This coding style facilitates the interpetation of product-interaction terms in multiple regression models (for details, see Pedhazur, 1982).

Prior to beginning the analysis, correlations among all of the variable indicators were examined. This analysis revealed that the individual satisfaction items were not psychometric proxies for each other. While three of the coefficients were in the .50 to .65 range, the remainder fell below .40.

No single satisfaction item explained more than 40% of the variance of another. Within the various sub-populations examined in the study, this pattern of small to moderate correlations among the satisfaction items also held.

Results

Results for the Basic Model in the Full Sample: The data column on the left side of Table 1 presents results for the basic regression model in the full sample. In that model, the dependent variable was overall evaluation, and the independent variables were all of the specific satisfaction variables, plus the gender and individual field variables (those in scientific and engineering fields were used as the comparison group for the analysis). The main effects of each of the six specific satisfaction items were statistically significant at the $p \leq .05$ level. In fact, the main effects for five of them (satisfaction with opportunities for interaction with other students, availability of professors, course stimulation, professors' teaching ability, and professors' commitment to their fields) were significant at the $p \leq .001$ level. The main effects of gender and field were not significant, however. This pattern implies that gender and field alone did not directly affect satisfaction levels.

The results for the basic model in the full sample provide evidence regarding the first hypothesis, which posited especially strong effects from social support factors, such as satisfaction with faculty availability and opportunities for interaction with other students. The regression coefficients do not support the hypothesis. Instead, the especially strong effects came from indicators of satisfaction with course stimulation and professors' teaching ability. It should be noted, however, that the differences in effect sizes

among these indicators, each of which had effects significant at the $p \leq .001$ level, were not especially large.

Results Regarding Gender Differences: Significant effects for product interaction terms suggested the existence of gender differences for five of the six satisfaction coefficients in the basic model: satisfaction with opportunities for interaction with other students, availability of professors, course stimulation, professors' teaching ability, and professors' commitment to their fields. Accordingly, the three right columns of Table 1 present the results for the basic model when the sample is divided by gender. The directions of the gender differences suggest that, compared to men, women weighted each of the specific satisfaction factors except knowledgability more strongly in arriving at their final evaluations of their major areas. This pattern of stronger effects is reflected in the overall explanatory power of the model: the R^2 for women (.63) was somewhat higher than that for men (.59). There were no significant gender differences in the effects of fields on overall satisfaction levels.

The results regarding gender differences support Hypothesis 2 in that the effects of the two indicators of satisfaction with social support (the indicators for satisfaction with opportunities to interact with other students and for satisfaction with faculty availability) were larger for women than for men. Nevertheless, these gender differences were not large. While both were significant at the $p \leq .15$ level, neither achieved significance at the $p \leq .05$ level. What is more, the most significant gender difference (and the only one to achieve significance at the $p \leq .05$ level) involved course stimulation, a factor not involved in the hypothesis. In summary, while both the general expectation of gender differences and the specific hypothesis regarding such

differences were upheld, the results suggest that such differences are not especially large and tend to be more pronounced in aspects of satisfaction other than those relating to social support.

Results Regarding Field Differences: Analysis of product interaction terms suggested that there were significant field differences in the weighting of three of the specific aspects of satisfaction. Those three differences involved satisfaction with professors' knowledge, satisfaction with course stimulation, and satisfaction with professors' teaching ability. Therefore, Table 2 presents the findings regarding field differences. The field difference involving professors' knowledge centers on the scientific and engineering majors: students in such majors were the only group to place a significant weight on such knowledge in their overall evaluations. It should be noted, however, that this first field difference was the weakest of the three found, and the only one not to achieve significance at the $p \leq .05$ level. The second field difference, which involved course stimulation, centered on the strong difference between students in business-related majors, who weighted course stimulation positively but not very highly, and other students. Social science and arts and humanities students placed particularly strong emphasis on course stimulation. The third and final field difference, which involved professors' teaching ability, was strongest in terms of significance level. Here, the contrast was especially strong between students majoring in the social sciences and business-related areas, on the one hand, and students in the arts and humanities, on the other. Teaching ability was extremely important to students in the latter kinds of majors, whereas it was of only marginal importance to the social science students. Strikingly, it was of no measurable significance to the management students.

The results regarding course stimulation and teaching ability bear directly on the third hypothesis. That hypothesis was supported in that the analysis revealed especially high weighting of teaching ability in the arts and humanities, and especially high weighting of course stimulation in the social sciences and arts and humanities. Those findings support the notion that attention to teaching quality is especially great in the liberal arts areas. The hypothesis was not fully supported, however. There was an absence of an especially high emphasis on teaching ability among social science students.

Results Regarding for Within-Field Gender Differences: Analysis of product interaction terms within major fields revealed only one area with significant within-field gender differences. That area was the scientific and engineering field, the most populous of the four fields studied.[4] Table 3 presents the results for science and engineering students disaggregated by gender. The first of the five gender differences uncovered among science and engineering majors involved faculty knowledgability, which apparently was weighted especially highly by males. While it is intriguing that this difference was not found significant in the overall sample, it was extremely small among science and engineering students and the only one of the five found among those students which was not significant at the $p \leq .05$ level. The remaining four gender differences, as highlighted in Table 3, involved satisfaction with opportunities for interaction with other students in the field, availability of professors, professors' teaching ability, and professors' commitment to their fields, respectively. These four differences were in the same direction as significant gender differences for the overall sample. In each case, however, the differences were more extreme than in the overall sample.

For example, the respective male and female coefficients for the faculty availability indicator were .13 and .27 within science and engineering, whereas they were .15 and .18 within the overall sample. Likewise, the respective coefficients for males and females on the student interaction indicator were .09 and .19 within science and engineering, whereas they were .10 and .12 for the overall sample. These last two findings provide strong support for the fourth hypothesis of the study. In traditionally male majors, it seems women indeed place especialy high weightings on various forms of social support.

Summary of the Results

The findings generally indicate that stimulating coursework and good teaching were somewhat more important factors in overall departmental satisfaction than opportunities for faculty/student interaction or perceived faculty knowledgability. There were significant gender and field differences, however. For example, faculty/student interaction (i.e., faculty availability) and course stimulation were more critical among women than men. Course stimulation was also involved in a critical field difference: it was more significant for students in the liberal arts and social sciences (roughly paralleling Biglan's "soft/pure" areas; see Biglan, 1973) than for those in the harder sciences and engineering. In the latter fields, faculty knowledgability was particularly significant. The most striking field difference involved the heavy emphasis on teaching ability among students in the arts and humanities. Thus, the analysis uncovered both gender and field differences. One might raise the question of whether or not field differences might not be simply artifacts of the tendency of men and women to choose different major fields. It appears not: the effects occured in the context of controls for gender, and when

significant gender differences were found within the science/engineering group, these differences were appreciably greater than those found in the overall sample.

The results outlined above provided no support for the first hypothesis examined: the prime criteria for satisfaction overall appeared to relate to course stimulation and teaching ability, rather than faculty availability and student/student interaction. The results supported the guiding proposition of the study, however. The three hypotheses derived from the central proposition were each strongly or partially supported. Women did indeed place strong emphasis on factors relating to social support. Students majoring in liberal arts did indeed tend to place heavier emphasis than other students on factors relating to teaching quality. Women in non-traditional majors (i.e., science and engineering majors) did indeed tend to place greater emphasis on aspects of social support, compared to both men in those majors and women in other majors.

Implications

The study reported here is, of course, by no means definitive. The data were gathered in the mid-1970's, a time when gender differences may have been sharper than in the mid-1980's. Similarly, the sample for the study was gathered at only two institutions. While those schools are, in fact, quite different from each other (one small and one large, one public and one private, one urban and one rural, etc.), they certainly do not comprise a representative sample of American postsecondary institutions. Similar studies with newer data and broader institutional samples are warranted. Yet several of the findings merit attention.

Notably, the finding here of gender differences in satisfaction criteria echos other studies of related topics such as aspirations and persistence (see especially Spady, 1971; Bean, 1980; and Phelan, 1979). It is becoming clear that, compared to college men, college women's outcomes are somewhat more strongly affected by certain kinds of faculty contact. Academic satisfaction may well be a strong mediating factor in outcomes relating to educational achievement and attainment, and the optimal conditions for satisfaction may differ by gender. The results also support the variety of studies finding discipline-based differences in values, cognitive styles, and organizational chaacteristics (see Biglan, 1973; Smart and Elton, 1975; Hackman and Taber, 1979). Most striking is the support for the hypothesis, derived from Biglan (1973), that aspects of teaching quality may be especially valued in the liberal arts. Also in line with Biglan's perspective is the finding of especially high emphasis on faculty knowledgability among students in the harder sciences.

Thus, the study's findings fit closely with those of others. Yet the study may contribute some new developments, as well. From a theoretical perspective, it focuses attention on group differences in weightings of aspects of satisfaction, as opposed to group differences in raw satisfaction levels. Academic satisfaction has been too little-explored in research on group differences in educational outcomes. The individual weightings behind such satisfaction, as part of the way people "process" their satisfaction rankings, have likewise received sparse attention. Past research has revealed differences in raw satisfaction ratings across genders and fields (e.g., see Neumann and Neumann, 1981), yet Table 1 reveals an absence of such differences in the context of a broader model in which some of the more specific factors behind

students' overall satisfaction were included (e.g., faculty availability, course stimulation). Thus, gender and field effects may be activated or mediated by factors of the kind investigated here. If satisfaction is itself indeed an important mediating factor in longer term educational achievements and attainments, new research on its workings, like that conducted here, may represent a useful step forward.

From both the theoretical and applied perspectives, the study's finding of gender differences among students in science and engineering majors represents an especially important avenue for further investigation. If such results are replicated elsewhere, they may add to understanding of attrition among women majoring in engineering and other non-traditional majors. To an extent, the suggestion here that women in such majors pay particular attention to faculty support fits the research literature on mentor relationships within organizations. That literature suggests that women in male-dominated corporations are especially aided in their personal advancement by social and political support from more powerful and experienced mentors within the organization (see, for example, Kanter, 1977).

From an academic management perspective, the study's finding of both field and gender differences supports the arguments of Bare (1980) and others that such differences have been too-little considered in evaluations of academic programs. Here, the raw effects of both gender and field on overall evaluations were nil in the context of a regression model containing a number of factors potentially mediating between grouping characteristics and overall evaluations (see Table 1). On the surface, this finding contradicts the Neumanns (1981) and supports Braskamp et al (1979). Yet, upon further examination, significant

gender and field differences in the criteria for satisfaction were indeed uncovered. Such findings lead to the conclusion that the processes of satisfaction formation are not uniform across such groupings. If systematic field and gender differences of this kind are consistently found to exist, aggregated student satisfaction data must be used with caution by administrators.

Indeed, perhaps the primary management messages arising from the present results are messages of caution. First, as Bare (1980) has stated, one of the primary recommendations of faculty and administrators for improving the teaching/learning process has been to seek improvements in the quality of interpersonal relations between faculty and students. Yet the findings here suggest, just as did those of Bare, that faculty supportiveness may not be as critical for departmental evaluations as various course and programmatic characteristics. Second, the results here uphold the conclusion of Neumann and Neumann (1983) that comparisons of students' faculty or program evaluations across a college or an entire university may create biases, owing to the differing nature of the various academic fields and their practitioners and clients. In the end, the choice by management of the way to use evaluation data is in some significant part a political choice (Kanter and Brinkerhoff, 1981). Data on students' department evaluations are no exception. In the politicized world of most contemporary campuses (see Cameron, 1981), the adoption of any standard for comparing departments' student satisfaction rankings will produce winners and losers. The results here hint that, in at least some part, any across-college or across-institution standard will inevitably not be neutral as to field and gender.

Third, the model used here was not as powerful as one might wish. Using satisfaction indicators relating to a set of specific departmental characteristics suggested by earlier research to be quite important in the evaluation process, the model at its best explained only just over half of the variance in students' final evaluations. If student satisfaction is indeed an aspect of departmental quality that is statistically distinct from other aspects of departmental quality (as suggested by Braskamp et al., 1979) then focusing solely on the independent variables used here will not in the end be enough.

Embedded in this last point is perhaps the most critical issue for potential criticism of the present study. The analysis tackles the bedeviling issue of "causation" in a way distinct from that of most of the earlier studies. To the question of "What causes academic satisfaction?", the mainstream literature has tended to answer in terms of empirically measurable behaviors relating to grades, involvement, and faculty-student interaction (see Astin, 1977; Pascarella, 1980; Bean and Bradley, 1984) or in terms of sociological and economic returns to the effort (see, for example, much of the work in the "human capital" and "social reproduction" research traditions; some of that work is reviewed in Hearn and Olzak, 1981). The present study, in contrast, attempts to answer the question from a more internal perspective, investigating the simultaneous interrelationships among the various aspects of student academic satisfaction. As such, its data were somewhat removed from the actual behavioral contexts and post-graduation rewards being evaluated by the students. Whether the approach may be considered justified depends in large part upon whether one can accept the absence of such factors in the model. Clearly, grades, academic involvements, faculty-student interactions, socioeconomic

payoffs, and academic satisfaction (in all its aspects) are intertwined in complex ways. While the present model of satisfaction may in some ways plow new ground, judgement concerning its lasting value (if any) will unquestionably depend upon its being successfully and productively integrated into the persuasive behavioral and socioeconomic models of mainstream research.

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FOOTNOTES

1. Two features of the analytic approach used for the study should be noted. First, it is indifferent both to differences in the specific satisfaction scores of individual students and to differences in the specific satisfaction scores of departments. Instead, the approach focuses upon the weightings of various factors in determining student satisfaction scores. This focus distinguishes the study from much of the prior work in the area. Second, as a colleague commented in reviewing this paper, the attention here to student satisfaction fits some emerging trends in the organizational effectiveness literature (see the Theoretical Perspectives section of the paper), but the study's reliance on survey data and quantitative methods would not sit well with many of that literature's more phenomenologically-oriented contributors.

2. Pedhazur (1982) cautions against the use of the wording "interaction effects" in studies without a true experimental design (e.g., without equal cell sizes for groupings). Here, the wording is used sparingly, and only to suggest the likely existence of group differences in regression effects.

3. These four areas roughly correspond to five of Holland's vocational types (Holland, 1973). Specifically, majors fitting Hollands's Realistic and Investigative categories are placed in the hard sciences and engineering category here, majors fitting his Social category are placed in the social science category here, majors fitting his Enterprising category are placed in the business-related category here, and majors fitting his Artistic catgory

are placed in the arts and humanities category here. For purposes of the present analysis, there were insufficient numbers of students with majors in Holland's Conventional category.

4. One other field had hints of a significant gender difference. Among students in business-related majors, women placed an appreciably higher weight than men on course stimulation in their overall evaluations. This effect was significant at the $p \leq .05$ level, but was not included in the main text discussion because the small number of women in those majors ($n = 29$) precludes very confident inferences.

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	Analysis of Gender Differences			
	Regression for Total Sample (n = 758)[b]	Regression for Males (n = 380)[b]	Regression for Females (n = 378)[b]	Significant Gender Difference?[c]
Satisfaction with:				
Profs.' Knowledge	.08*	.11*	.06	No
Opportunities for Interaction	.11***	.10***	.12***	Yes (p = .11)
Availability of Profs.	.17***	.15***	.18***	Yes (p = .09)
Course Stimulation	.27***	.24***	.30***	Yes (p = .03)
Profs.' Teaching Ability	.23***	.23***	.24***	Yes (p = .10)
Profs.' Commitment	.16***	.13**	.19***	Yes (p = .08)
Gender (male = 1, female = -1)	.01	--	--	--
Social Science Major	.03	.06	.01	No
Business Major	.04	.06	-.02	No
Arts/Humanities Major	-.06	-.08	-.06	No
Intercept	-.08	.10	-.31	--
R^2	.61	.59	.63	--

Table 1: Basic Gender Differences in the Determinants of Academic Satisfaction[a]

Note a: For details of indicator definitions, see text. Unstandardized regression coefficients are presented. Significance level code: *** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$.

Note b: Students in science and engineering majors were used as the regression comparison group.

Note c: Gender differences were inferred when the appropriate product interaction term, added to the overall (full) model, was significant at the $p \leq .15$ level (see Pedhazur, 1982).

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		Analysis of Field Differences				
	Regression for Total Sample (n = 758)[b]	Regression for Science/Engineering Majors (n = 360)	Regression for Social Science Majors (n = 196)	Regression for Business-Related Majors (n = 92)	Regression for Arts/Humanities Majors (n = 110)	Significant Field Difference?[c]
Satisfaction with:						
Profs.' Knowledge	.08*	.14**	.05	.01	.02	Yes (p = .14)
Opportunities for Interaction	.11***	.13***	.10*	.14*	.10*	No
Availability of Profs.	.17***	.17***	.17***	.16*	.17**	No
Course Stimulation	.27***	.26***	.34***	.17*	.28***	Yes (p = .04)
Profs.' Teaching Ability	.23***	.25***	.14**	.16	.36***	Yes (p = .01)
Profs.' Commitment	.16***	.10*	.21***	.25**	.18	No
Gender (male = 1, female = -1)	.01	-.01	.05	.03	-.05	No
Social Science Major	.03	—	—	—	—	—
Business Major	.04	—	—	—	—	—
Arts/Humanities Major	-.06	—	—	—	—	—
Intercept	-.08	-.10	-.02	.35	-.32	—
R^2	.61	.59	.65	.49	.70	—

Table 2: Basic Field Differences in the Determinants of Academic Satisfaction[a]

Note a: For details of indicator definitions, see text. Unstandardized regression coefficients are presented. Significance level code: *** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$.

Note b: Students in science and engineering majors were used as the regression comparison group.

Note c: Field differences were inferred when the appropriate product interaction term, added to the overall (full) model, was significant at the $p \leq .15$ level (see Pedhazur, 1982).

	Analysis for Science/Engineering Majors		
	Regression for Males (n = 237)	Regression for Females (n = 123)	Significant Gender Difference?[b]
Satisfaction with:			
Profs.' Knowledge	.16*	.14	Yes (p = .09)
Opportunities for Interaction	.09*	.19***	Yes (p = .01)
Availability of Profs.	.13**	.27***	Yes (p = .01)
Course Stimulation	.29***	.23***	No
Profs.' Teaching Ability	.23***	.29***	Yes (p = .02)
Profs.' Commitment	.01	.24**	Yes (p = .01)
Intercept	.29	.13	—
R^2	.57	.68	—

Table 3: Gender Differences

Within Science/Engineering in the Determinants of

Academic Satisfaction[a]

Note a: For details of indicator definitions, see text. Unstandardized regression coefficients are presented. Significance level code: *** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$.

Note b: Gender differences were inferred when the appropriate product interaction term, added to the overall (full) model, was significant at the $p \leq .15$ level (see Pedhazur, 1982).